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pearance encourages us in the hope that bee keeping will be conducted on a more scientific basis than ever before in this country.

UNDERGROUND TREASURES ; HOW AND WHERE TO FIND THEM.* The design of this little book is to make every farmer and land-owner his own mining engineer, and when his knowledge is exhausted to induce him to go to some professional mining engineer for advice. Perhaps the recent diamond swindle demonstrates the need of just such a guide as this. The plan seems well carried out, the descriptions of minerals, ores and gems being terse and clear, and the hints as to how to find them are practical. After describing the eighty minerals which out of two hundred and forty-four found within the United States are of practical use, the author gives chapters on "Prospecting for Diamonds, Gold, Silver, Copper, Lead and Iron," "Mineral Springs," "Artificial Jewelry—How Made and How Detected," "Discovery of Gold in California," and a concluding one on the "Discovery of Silver in Nevada."

BOTANY.

PAST VEGETATION OF THE GLOBE.—Nine years after the publication of Brongniart's "Tableau" Dr. Paterson discovered, in a bituminous shale near Edinburgh, *Pothocites Grantoni*, which has been generally accepted ever since as a monocotyledonous flowering plant. It can therefore no longer be asserted that in the Palæozoic period the higher Phanerogams were absent. Nor can it be even said that, amongst Phanerogams, *Pothocites* belongs to a very primitive type. The condensation of its inflorescence and the reduced structure of its flowers imply, on any hypothesis of evolution, the previous existence of flowering plants which had undergone less differentiation. Indeed, for anything that can be positively said to the contrary, there may have been during the Carboniferous epoch a phanerogamic covering to the earth hardly less complicated than there is now. Our knowledge of the vegetation of that time is confined to the forests of arborescent Cryptogams fringing the deltas of great rivers. Stems of coniferous trees were occasionally floated down from the higher ground ; of the plants that grew with them we know nothing.

* Underground Treasures: How and Where to Find Them. A Key for the Ready Examination of all the Useful Minerals within the United States. By Prof. James Orton. Illustrated. Hartford, Conn. Worthington, Dustin & Co. 1872. 12mo, pp. 137.

Still less can it be said of the Mesozoic period that its fossil remains convey any adequate notion of the contemporary *facies* of the vegetation. The cones and driftwood that occur in rocks of marine formation of this age would have been little injured by immersion in water in which the flowers and foliage of less rigid plants would speedily have decomposed beyond recognition. Such guesses as we can make about the actual vegetation of Mesozoic land surfaces stand in the same relation to the reality as do those which a traveller would make in approaching a new country from the ocean, and in collecting the vegetable waifs and strays borne out to sea by currents, to the estimate which he afterwards forms when he botanizes at leisure on the land itself. It is, however, only fair to admit that if arborescent Dicotyledons existed to any large extent anterior to the chalk, it is hardly explicable that we have as yet no evidence from driftwood that this was the fact, except Mr. Sorby's notice of some non-gymnospermous wood from the Lias near Bristol,* which appears to have been overlooked. In the "dirt-bed" of the Upper Oolite we have a true land surface, but the ligneous plants of this were undoubtedly gymnospermous. It is far from improbable however that, at any rate, herbaceous Dicotyledons had made their appearance in the Mesozoic period. Monocotyledons, as already pointed out, are certainly known to date from a time still earlier, and in the herbaceous condition Dicotyledons are less different from Monocotyledons than when they become woody. Several facts seem to prove that existing trees are more modern than herbaceous plants belonging to the same groups. They have, for example, more confined ranges, and often represent on oceanic islands, apparently because the exaltation of their stature has had less to struggle against, orders which elsewhere comprise only herbaceous plants. Probably in every group the arborescent habit has been a subsequent development. — W. T. THISELTON DYER in *The Academy*.

SEEDS AS PROJECTILES.—*Editors of Naturalist*: Allow me the favor to correct the phraseology I, by some unaccountable slip of the tongue, employed in referring to the Hamamelis seed. It is the contracting of the horny *endocarp* not the horny "albumen," which projects the seeds.—THOMAS MEEHAN.

*Transactions Microscopical Society, vol. iii, p. 91.

HOW THE BUFFALO GRASS DISAPPEARS.—Prof. Mudge in an interesting letter in the "Kansas Farmer" on northwestern Kansas, gives some interesting facts as to the gradual disappearance of the buffalo grass and the incoming of other grasses before the advent of civilized men. He says:

"The steadiness and regularity of this change is interesting. Seventeen years ago the buffalo grass covered the hills and prairies about Manhattan, but it has been gone many years. Six summers ago, when we first visited the forks of the Solomon, we found it everywhere except close to the river bank. Two years later, the blue stems had possession of half the bottom. Now the buffalo grass has entirely left the latter ground, and is fast vanishing from the high prairie. In November, 1866, we visited Smith and Phillips counties, then unsettled, and found buffalo grass in full possession, but this summer it had disappeared to the extent of one-half in the bottoms, and the tall grasses had become intermingled with it. On the high lands the change had already begun, but to a limited extent. On the Prairie Dog and at the upper portions of the Middle Fork, we found the change just commencing. In crossing from Cedarville to Bull City in Osborne county, we noticed that the buffalo grass had left the divide to the extent of one-third, and the coarser grasses above named had taken its place.

We thus record a few of these changes, that others may notice the regularity and rapidity of the disappearance of the buffalo grass."

HEPATICÆ CUBENSES WRIGHTIANÆ. — Under tickets with this heading Mr. Charles Wright has distributed a few sets (varying from two hundred to one hundred and fifty species) of *Hepaticæ* collected by him in Cuba several years ago. They have in the meantime been studied by Gottsché of Altona, who is the principal authority in Hepatic mosses, and are named by him. The authentic names are given upon the tickets. The sets are to be disposed of, at ten dollars the hundred specimens, upon application to Mr. Wright, at the Herbarium of Harvard University.

A GRAND HERBARIUM. — The herbarium of Columbia college, New York, is to have added to it the immense collection of Dr. Meissner, the distinguished Professor of the University of Basle. This herbarium contains 63,000 species, and is purchased for the college through the liberality of J. J. Croke, Esq., a wealthy amateur scientist. The present herbarium of the college is the invaluable one of Dr. John Torrey, and is especially rich in

typical specimens. With the proposed addition it is said that it will be the largest herbarium in the country.

ZOOLOGY.

CEMIOSTOMA AGAIN—In my note *ante*, p. 489, I have stated that in the "Transactions of the London Entomological Society" Ser. 2, vol. 5, pp. 21 and 27, and in Ser. 3, vol. 2, p. 101, certainly two, and if my memory serves me aright three, species of *Cemiosstoma* have been described from India. These references were evidently made from memory. It seems from Mr. Mann's note *ante*, p. 606, that but two species are mentioned on the pages referred to and those two are from England, not from India. Nevertheless, I am still convinced that my memory is not utterly at fault, and that species of *Cemiosstoma* have been discovered in India, and when the opportunity again offers I will look them up. Many months had elapsed after I saw the "Trans. Lond. Ent. Soc." before my note on p. 489 was written, and probably I have confounded in my mind the above references with some other. Eastern naturalists surrounded by fine collections, libraries and every facility for study can scarcely appreciate the difficulties with which their less favored western brethren have to contend; and Mr. Mann no doubt learned whilst in Brazil that want of the means of reference to what others have done is a very different thing from "negligence."

Cemiosstoma, *Phyllocnistis*, many species of *Lithocolletis* and a few other genera of *Tineina* have a spot *in the apical part* of the wing which I have therefore called "the apical spot." In *Phyllocnistis* and in *Lithocolletis* this spot is always *at* the apex: but in *Cemiosstoma* it is always at the inner angle. So characteristic of each of these genera is the position of the spot in it, that when the name of the genus is given and its spot is mentioned, the student who is familiar with the genus knows at once where the spot is located; just as Mr. Mann knew at once from my description the location of the spot in *C. albella*, although he had never seen the species and although I called it, for brevity, and not through negligence, "the apical spot" instead of "the spot located at the inner angle." But if the phrase "apical spot" might have been misleading had it stood alone, it could not have been so in the description of *C. albella*, because it is connected with the state-